

The critique of DALYs: a counter-reply*

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The DALY Review Group of the WHO Advisory Committee on Health Research (ACHR) believes that, unless they are constructed purely as an intellectual exercise, indicators should have a function — ultimately to guide decision-making about resource allocation. Disability-adjusted life years (DALYs) obscure too much and in its present stage of development the DALY approach does not solve the problem of prioritization and of resource allocation and may yet turn out to have been a side-track.

The article cited by Murray & Lopez in the previous paper (1), and which is the main subject of their discussion, is based on an Annex to the Report of the Thirty-third Global Advisory Committee on Health Research (ACHR) Meeting, held in October 1995 (2, 3). The DALY Review Group of the ACHR believes that, unless they are constructed as a purely intellectual exercise, indicators should have a function — ultimately to guide decision-making about resource allocation; hence, contrary to the assertion raised by Murray & Lopez, the ACHR considered the disability-adjusted life year (DALY) quite specifically in this broader context of its potential for application. Indeed, Murray & Lopez seem to be labouring also under certain other misapprehensions about our view of their construct, as outlined below.

One of our major difficulties with the DALY is that it obscures too much. It has been asserted that the DALY is no worse in this respect than any other summary indicator and we recognize that formulating the DALY is an attempt to move in the right direction by taking account of morbidity as well as mortality. Nevertheless, the ultimate purpose of indicators is to permit appropriate interventions to be devised and priorities to be set; the challenge at this stage of global health needs is to develop indicators that can provide a detailed picture of the sources of morbidity and mortality, their distribution, and their determinants. Only then can resource allocation and effort be guided effectively.

Another major difficulty lies in the complexity of the issues to be considered. Regional heterogeneity, for example, is more complex than Murray & Lopez imply. Thus the impact of disability depends on the economic, family and social circumstances of the individual; this must influence the true “burden” that the disability represents for the individual, the family, and the community and the appropriate level of additional support that should be provided. Disparities across communities arising from these factors may be widespread and result in complex population-wide heterogeneity. Equity demands that this be taken into account, which requires that the origins and impact of the overall disability “burden” need to be identified. It is therefore pointless to press towards a single numerical measure, which, in use, must be immediately disaggregated. To this end, and in its present format, the DALY seems powerless.

Multipathology is not the same as multicausality. Multiple risk factors are undoubtedly involved in the occurrence of various individual diseases, but the simultaneous coexistence of more than one disease in a given individual is quite a different issue — although it is by no means uncommon in developing countries. There is thus a latent difficulty that may only be perceived when an intervention planned on the hypothesis of a single disease fails to make the anticipated impact; the DALY does not take account of this difficulty. Validation of an indicator demands that its value be logically linked to the realities of disease and disability. The occurrence of multipathology ensures that the DALY, at least as it is currently formulated, cannot offer this realistic linkage.

Furthermore, decisions about actions that focus on risk factors, disregarding the psychosocial origins (physical, psychosocial and economic) of certain of these risk factors, exclude the option of socioeconomic measures that may be much more effective than explicit public health interventions. The operation of other powerful factors also needs to be recognized. Psychological and cultural perceptions of health and disease, for example, influence whether

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and when individuals seek or accept care. Indeed, priorities for health policy or health system research cannot be derived from simple mathematical formulae that do not take account of such elements.

We have no points to make about the mathematical formulation of the DALY, since we regard the details as largely serving to distract attention from the main issues. Nevertheless, we should remark that, because the cultural perceptions that operate in different communities differ greatly, even the generalities underlying these details should also differ, vitiating attempts at cross-cultural comparisons.

Murray & Lopez wonder what is meant by the Review Group's comment that the DALY remains unvalidated. Validation of an indicator includes showing that its behaviour in response to random error, and to systematic bias in the raw data, is acceptable, because such errors and bias are inevitable in practice. In our view, it is not justified to promote the use of a new indicator until this issue has been clarified. Because of the complexity of the formulation of the DALY, the effect of error in the raw data is not intuitively obvious. Murray & Lopez have investigated the sensitivity of their formula to parameter change which, though proper, contributes nothing to validating the indicator. However, we are not aware of any published material on sensitivity to random error or bias in the input data and we therefore explored this, as described below.

Computer simulations can be used to illustrate the problem quite simply by using some of Murray & Lopez's ancillary concepts such as the age-weighted sum of life lived with a disability. Even here, using the simplest assumptions, the effect on the calculation of random zero-mean error or of systematic bias in the raw data is greatly influenced by the age of onset, and may be substantial. For example, a variability of 1% in age data for someone suffering an ongoing disability at 30 years of age until the age of 70 years generates about 1% variability in the age-weighted sum, and pro rata for larger percentages. However, for an individual suffering a disability at 60 years of age, the 1% input variability is scaled up by a factor of about 6.7, i.e., to about 6.7%. Quite similar findings apply to systematic bias. Without needing to report the results of such simulations on other elements of the formulation, we believe that there is an evident case that further clarification should be offered before promoting the use of the DALY.

Our views on the DALY have been summarized elsewhere (4), and we draw attention also to the critique presented by Anand & Hanson (5). In short, we welcome the attention focused by Murray & Lopez on morbidity, and their recognition that it is as significant a component as mortality in its contribution to the totality of the human cost of disease, trauma, and accident. However, at present we must conclude that the DALY approach does not solve the problem of prioritization and of resource allocation and may yet turn out to have been a side-track.

Résumé

Critique du DALY: réplique aux arguments présentés pour sa défense

Le groupe chargé de l'étude du DALY au sein du Comité consultatif OMS de la recherche en santé (CCRS) estime qu'à moins d'être considérés comme de simples exercices intellectuels, les indicateurs doivent remplir une fonction, qui est en définitive de faciliter la prise de décisions concernant l'allocation des ressources. L'indicateur DALY (années de vie corrigées de l'incapacité) brouille trop la réalité et la méthode DALY qui, dans l'état actuel des choses, ne résout pas les problèmes de priorité et d'allocation des ressources, risque de conduire à terme à une impasse.

References

1. Murray CJL, Lopez AD. The utility of DALYs for public health policy and research: a reply. *Bulletin of the World Health Organization*, 1997, **75**: 377-381.
2. ACHR News. *Bulletin of the World Health Organization*, 1996, **74**: 333-334.
3. WHO Global Advisory Committee on Health Research, *Report of the 33rd session of the Global ACHR, Geneva, October 1995, Annex 2: Report of the DALY Review Group*.
4. Sayers B McA et al. The disability adjusted life year concept: a comment. *European journal of public health*, 1997, **7**(1): 113.
5. Anand S, Hanson K. *Disability-adjusted life years: a critical review*. Cambridge, MA, Harvard Center for Population and Development Studies, Harvard Center for Population and Development Studies, September 1995 (Working Paper Series, No. 95.06).